Control/Tracking Number: 11-SA-3809-ACSM
Activity: Scientific Abstract
Current Date/Time: 2/25/2011 5:36:38 AM

An Analysis of the Impact of Acute Sleep Deprivation on Repeat Cycling Time Trial Performance

Author Block Gregory C. May, Paula A. Fitzpatrick, Sarah Jane Cullen, Lauren Kelly, Anna O'Hagan, Giles D. Warrington, FACSM. Dublin City University, Dublin, Ireland.
Email: gregory.c.may@gmail.com

Abstract:
Ultra-endurance cycling events, such as the Race Around Ireland (RAI), involve performing periods of intermittent high intensity cycling for extended durations. The ability to maintain a consistently high mean power output whilst in a sleep deprived state is a critical factor in optimising performance. Purpose: To evaluate the effects of acute sleep deprivation, over 24 hours, on a repeat cycling time trial performance. Methods: Six trained male cyclists (mean ± SD: age 33 ± 4 years; height 1.82 ± 0.03 m; mass 79.3 ± 8 kg) were tested on 3 occasions; each testing bout was separated by 7 days, within a 21 day period. During the first test, subjects performed a maximal incremental test on an electromagnetically braked cycle ergometer. Following a standardised recovery period, each subject then completed a baseline 20 minute self-paced maximal performance test (MPT). The subjects subsequently returned on two further occasions to perform two 24 hour trials. During the course of each 24 hour trial the subjects performed a total of 4 MPT's at set time points in either a sleep deprived (SDep) and or sleep normal (SNorm) state using a randomised crossover design. The MPT's were undertaken at 0 (T1); 8 (T2); 17 (T3); and 24 hours (T4). During the SDep trial subjects accrued no sleep, while during the SNorm trial they were allocated an 8 hour sleep period between T2 and T3. Results: SNorm resulted in a mean sleep duration of 365 ± 38 minutes. No significant differences were found across baseline trials for each of the 3 tests or for the mean cumulative distance covered over the 4 MPT's (T1-T4) for SDep compared to SNorm. Further analysis of the data revealed a significant decrease in the total distance covered during the MPT at T3 when compared with T2 (13331m ± 1139m vs. 13867m ± 1234m, $p<0.05$) for the SDep trial. In contrast, no significant differences were observed across trials in the SNorm group. Conclusions: Despite a 4 % decrease in the MPT observed during a time period usually associated with sleep (T2-T3), acute sleep deprivation over 24 hours had no significant impact in overall time trial performance.

This work is supported by Science Foundation Ireland under grant 07/CE/I1147

Author Disclosure Information: G.C. May: None.